CAP AND AGROFORESTRY PRACTICES IN EUROPE

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Introduction

Agroforestry (AF) definition is based on the presence of woody vegetation and an agricultural activity providing products for farmers. Even though the word "forestry" is usually linked to that AF concept, AF is behind the forestry concept including for example shrubs or fruit trees when there are at least two products obtained from the tree and from the understory, including animal products. Based on these concepts, the most agreed definition of AF is "the integration of woody vegetation, crops and/or livestock on the same area of land (EURAF 2015, FAO 2013a, 2013b, IPCC 2003 and USDA 2011). However, the definition of AF is not clearly identified within the EU Common Agrian Policy (CAP). This paper aims at defining the main agroforestry practices in Europe and linking them to EU CAP.

Ecological importance of Agroforestry practices

The importance of woody vegetation within the AF concept is based on the fact that woody vegetation is a key-trait from an ecological point of view as this component provides to the system a large number of benefits from a productive and environment perspective, which is linked to the ecointensification concept. Increasing land production should be based on the improvement of the use of the natural resources (light, nutrient, water..). Combining woody and no-woody vegetation in the same unit of land causes an improvement of the radiation capture as a high leaf area is combined in a vertical structure in the same unit of land. Complementary to this aboveground part of the system, belowground volume is better explored by different root species, and therefore nutrients are more efficiently used by the combination of combination of the woody vegetation (deeper, stronger and more permanent roots) and non-woody vegetation, usually with a large proportion of its roots at surface level. This highly effective integration of vegetal components at aerial and soil levels conducts to an increase of the efficiency of the use of the radiation (energy), air (CO2) and soil (macro and micronutrients) of existing resources from several points of view. First of all because of the higher level of light and soil nutrient absorption and secondly because of the complementarity of its components and their different behaviour on obtaining resources, which reduces the risk of nutrient losses, promoting at the end nutrient re-cycling at plot level, and reducing the negative impact of nutrient leaching (nitrate, phosphorous…) at farm and landscape level (Rigueiro et al. 2009). Therefore going beyond and implementing a natural bioeconomy concept. Besides this, the integration of woody and non-woody vegetation and also livestock when animal production is part of the system causes heterogeneity at soil surface level, increasing vegetal but also microbial biodiversity in the plot (Rosa-García et al. 2012).

Agroforestry practices

Agroforestry systems are integrated systems including agroforestry practices as part of the strategies of a farm. Agroforestry practices are practices implemented at plot level necessarily including woody vegetation. Therefore, there are thousands of types of AF systems (different combinations of trees, animals and herbaceous components adapted to local conditions) based on the combination of few AF practices adapted to different environment from both spatial but also temporarily point of view. Landscape AF is linked to a mosaic of woody and no woody land use at landscape level that does not belong to the same farm and may be not connected, but provides ecosystem services and public goods at global level. Moreover, besides the definition of AF as land use, AF is also linked to the production of at least two products from non-woody and woody vegetation in the same unit of land. The main AF practices in Europe are defined in Table 1. The use of these practices in Europe can be broadly identified thanks to the use of LUCAS.

Main agroforestry practices in Europe linked to the use of the territory include silvopasture, silvoarable, forest farming, Riparian buffer strips and Kitchengarden. Silvopasture (combining trees with forage and animal production) is the largest AF practice in Europe, representing the 85% of the European AF land use. It comprises forest or woodland grazing and open forest trees where trees can follow a distribution in isolated/scattered trees and/or line belts distribution. Silvopasture is the most used AF practice across Europe as it occupies over 18 million hectares (4.27% of the EU territory and the 25% of the land considered as grasslands), leaving around 75% of the EU grassland as potential areas where AF practices can be implemented. Silvopasture is mostly linked to Southern and Northern EU countries. AF Kitchengardens are defined by the combination of trees with vegetable production in urban areas, also known as part of "trees outside the forest" concept. Close to 60% of kitchengardens have fruit trees and therefore are linked to agroforestry, leaving around 40% of potential area to use a woody component. Silvoarable definition is widely spaced trees inter-cropped with annual or perennial crops. Trees can be distributed following an alley cropping, isolated/scattered trees and line belts distribution. The percentage of EU countries territory allocated to silvoarable practices is very low (0.03% of the EU territory occupied by permanent crops, woodland and shrubland with sparse tree cover and the 0.4% of the arable land of Europe) if we consider the areas with permanent crops, but, similar to that found in other temperate and developed countries (USDA 2015). Riparian buffer strips are strips of perennial vegetation (tree/shrub and grass) natural or planted between croplands/pastures and water sources such as streams, lakes, wetlands, and ponds to protect water quality. This practice is highly relevant to protect water bodies but occupies less than 0.1% of the EU territory. Forest farming is an agroforestry practice linked to forested areas used for production or harvest of natural standing specialty crops for medicinal, ornamental or culinary uses. There are not European official statistics linked to the territorial use of forest farming, in spite of the importance of this sector supplying goods and services. In the last Ministerial Conference on the protection of forests in Europe (2015b), it was presented that the total value of marketed non-wood goods are 2.3 million of Euros in Europe, being mainly represented by plant products (1.68 million of Euros) but also by animal products (0.62 million of Euros). Improved fallow is an AF practice implying the use of fast growing, preferably leguminous woody species planted during the fallow phase of shifting cultivation; the woody species improve soil fertility and may yield economic products, sometimes linked to slash and burn. Fallow land occupies over 15 million hectares in Europe (3.5% of the territory and the 2.07% of the arable land). Multipurpose trees are defined as fruit and other trees randomly or systematically planted in cropland or pasture for the purpose of providing fruit, fuelwood, fodder and timber, among other services, on farms and rangelands and is a subgroup of silvopasture (4.4%) and silvoarable (1%).

CAP and Agroforestry practices

Farmers having entitlements have to link their rights to be paid to lands that are eligible in order to receive the CAP direct payments. There are three types of land use suitable to receive direct payments: Arable lands, Permanent grasslands and Permanent crops. Arable land os linked to silvoarable AF practice. Arable lands are eligible when woody vegetation are within the defined rules provided by the cross-compliance that deal with measures to protect already existing woody component in arable, but not with the increase of these landscape features. In general, around 10% of the arable land is allowed to have already existing woody component to con2ider the fully arable land eligible. Permanent grassland is linked to silvopasture practices. EU eligibility has allowed countries to have permanent grasslands with woody vegetation over 50% eligible if they are declared "local practices". However, strong efforts should be carried out to promote countries to declare as "local practices" the traditional practices of all southern areas linked to permanent grassland grazing. Southern countries permanent grasslands are mostly sustainable thanks to the presence of woody vegetation (trees or shrubs), as these ecological forms have the possibility to survive to the long summer period of time (deeper roots able to uptake water), so, supplying

feed for animals. This drought period causes an enormous fire risk that should be counteracted by grazing, while obtaining safety food products.

Permanent crops are linked to homegarden agroforestry practices including fruit trees and are fully eligible. Moreover, some tree species managed as short rotation coppice are fully eligible independently of tree cover and density.

Conclusions

Agroforestry practices are poorly implemented in Europe with the exception of silvopasture and homegardens. Therefore, there is a huge potential to extend the benefits of AF practices across Europe to increase ecosystem services. Pillar I of CAP linked to AF are mostly related to silvopasture, silvoarable and multipurpose trees but not to improved fallow or forest farming, more linked to Pillar II.

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